

Remarks/Arguments:

I. Summary of the Invention

The present invention as claimed in claim 1, requires an electrically conducting gas diffusion substrate comprising an electrically conducting porous structure and a first catalytic component. Independent claim 1 specifies that the first catalytic component has a first catalyst supported on an electrically *non-conducting support*.

II. Discussion of Hausler (U.S. Patent No. 3,881,957)

Hausler discloses an electrochemical cell comprising a catalytic electrode of a refractory oxide and a carbonaceous pyropolymer. The purpose of the invention in Hausler is to provide an electrode for an electrochemical cell where the electrode is a refractory oxide with a large surface area and is coated with a carbonaceous pyropolymer such that the electrode has a specific conductivity. See e.g., col. 3, lines 4-11. Hausler describes in detail how the refractory metal oxide is imparted with semi-conducting properties by covering it with a carbonaceous layer (see e.g. col. 7, line 1 to col. 8, line 23 and figure 2). The semi-conducting refractory oxide serves the dual role of catalyzing the formation of the semi-conducting pyropolymer from the organic pyrolyzable substances *and* providing the establishment of the donor-acceptor charge-transfer complexes. Col. 8, lines 55-59.

III. The Office Action

The Office Action rejects claims 1-9 and 12 under 35 U.S.C. §102(b) as anticipated by Hausler (U.S. Patent No. 3,881,957). The Office Action also rejects claims 1-13 and 15-52 under 35 U.S.C. §103(a) as unpatentable over Wilkinson et al. (EP 0 736 921) in view of Hausler. The Examiner submits that a skilled artisen would find it obvious to modify Wilkinson et al. to employ a catalyst on a non-conductive support as taught by Hausler thereby increasing the electrical conductivity of the electrodes.

A. Lack of Anticipation

Anticipation requires that each and every claim limitation be found either expressly or inherently in a single prior art reference. Hausler does not disclose each and every feature required by independent claim 1 of the present application. More specifically, Hausler fails to disclose the claimed feature of a catalyst supported on an electrically *non-conducting support*.

In support of the Examiner's rejection, the Examiner states "alumina is non-conducting as it is the same material claimed by the applicant." The applicants assume that the Examiner is identifying the alumina, described as a refractory oxide at col. 5, lines 61-67 of Hausler, as anticipating the claimed feature of a *non-conducting support*. The applicants agree that alumina itself is non-conducting. However, Hausler does not employ alumina alone. Hausler uses any refractory oxide, providing the example of alumina, to form a semi-conducting support. Hausler teaches modifying a refractory oxide to increase its conductivity by depositing a carbonaceous pyropolymer on the refractory oxide so that the modified refractory oxide can be used to prepare electrically-conducting electrodes (e.g., as used in the electrochemical cell of figure 3). See also col. 7, line 1 to col. 8, line 23. Moreover, Hausler expressly states the purpose of the modified refractory oxide, that is, to catalyze the formation of the semi-conducting pyropolymer from the organic pyrolyzable substances *and* provide the establishment of the donor-acceptor charge-transfer complexes. Col. 8, lines 55-59. Because of the express admission in Hausler that the refractory oxide (i.e., the alumina) is manipulated so that it becomes a conductive species, the applicants submit that one of ordinary skill in the art would not characterize the refractory oxide in Hausler as a non-conducting support. Reconsideration of the rejection is earnestly solicited.

B. Non-obviousness

A modification of a reference can only be made when there is some motivation to modify that reference either in the reference itself, in another prior art reference, or in the knowledge of one of ordinary skill in the art. The resulting modified reference must teach each and every claimed feature. The applicants submit that (1) there is no motivation to modify Wilkinson et al. in view of Hausler because Hausler is directed to different subject matter than Wilkinson et al., and (2) even if properly combined, the combination of Wilkinson et al. and Hausler fails to teach every feature of the claimed invention.

One of ordinary skill in the art would not be motivated to modify or combine Wilkinson et al. with Hausler to enhance the conductivity as taught by Hausler because these references are directed to different subject matter. The Examiner states, "[i]t is noted that Hausler's invention is directed towards fuel cells of the solid electrolyte type, such as in Wilkinson et al." The applicant's submit that it is not correct to say that the solid electrolyte fuel cells described in Hausler and in Wilkinson et al. are of the same type. Hausler is directed to "high temperature fuel cells which operate 800°C to 1200°C [and] use solid electrolytes." Col. 1, lines 58-60.

(Hausler does not mention fuel cells that operate below 200°C.) In contrast, Wilkinson et al. is directed to and describes low temperature fuel cells, such as polymer electrolyte membrane fuel cells that typically operate between temperatures of 70°C and 120°C (see e.g., col. 1, lines 1-6 of Wilkinson et al.). The technical considerations for high temperature fuel cells and low temperature fuel cells are completely different. Thus, there is no reason why one of ordinary skill in the art would look to the high temperature fuel cell described in Hausler when attempting to modify a low temperature fuel cell as described in Wilkinson. Because there is no motivation to modify the prior art references, the examiner's rejection is in error. Reconsideration is earnestly solicited.

Furthermore, the Examiner states the motivation to modify Wilkinson et al. is because "[t]he skilled artisan would find obvious to modify Wilkinson et al.'s invention by employing a catalyst on a non-conductive support. The motivation for such a modification would be to enhance the electrical conductivity of the electrode, as taught by Hausler." The applicants respectfully disagree. One of ordinary skill in the art would not expect the inclusion of a non-conductive support to increase conductivity. The Examiner's motivation to modify the references goes against logic and is in error.

Even if there was proper motivation to modify Wilkinson et al. in view of the disclosure of Hausler, the applicants submit that the claimed feature of a non-conductive support is not met by the modified Wilkinson reference. As discussed above, Hausler teaches modification of a refractory oxide to make it semi-conducting. In contrast, independent claim 1 of the present invention requires a non-conducting support. For this additional reason, the Examiner's rejection is in error. Reconsideration is earnestly solicited.

IV. Conclusion

For the reasons set forth above, the applicants submit that Hausler does not disclose each and every feature of the claimed invention. Specifically Hausler does not disclose a non-conducting support. Hausler teaches forming a non-conducting support into a semi-conducting species. Moreover, the claimed invention is not obvious over Wilkinson et al. and Hausler because (1) the references are directed to different subject matter and one of ordinary skill in the art would not look to Hausler to modify Wilkinson et al., (2) the motivation provided by the Examiner to modify Wilkinson is contrary to logic, and (3) even if there was proper motivation

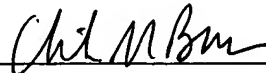
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to modify Wilkinson et al., the modified reference fails to disclose every feature of the claimed invention.

Because claims 2-13 and 15-52 depend either directly or indirectly from claim 1 and are read to include the features of the claims from which they depend, for the same reason claim 1 is patentable, so are the remaining claims. For at least these reasons, the applicant submit that the rejections are in error and respectfully request reconsideration.

Respectfully submitted,



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